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EXAMINER

KIKNADZE, IRAKLI

ART UNIT

PAPER NUMBER

2882

DATE MAILED: 06/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/982,192

Applicant(s)

DOBBS, JOHN M.

Examiner

Irakli Kiknadze

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-11, 17, 19 and 20 is/are allowed.
- 6) ☒ Claim(s) 12, 16 and 18 is/are rejected.
- 7) ☒ Claim(s) 13-15 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Objections*

1. Claims 14 and 15 objected to because of the following informalities:  
according to claimed subject matter (said first and second intensity magnitudes and said principal detector and said auxiliary detector) claims 14 and 15 have to be depend on claim 13. Appropriate correction is required.
2. Claim 18 recites the limitation " said sample" in line 6. There is insufficient antecedent basis for this limitation in the claim. Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 12, 16 and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Popescu (US Patent 5,822,393).

With respect to claims 12 and 16, Popescu discloses (Fig. 2) a CT system, comprising: an x-ray source (1) for generating x-rays (2) in response to a voltage provided by a voltage source (8); a detection system (3) for detecting x-rays (2) generated by the x-ray source (1) and transmitted through a target object (P); a kV meter (9) for measuring an energy spectrum of x-rays generated by the x-ray source

(1); a processor for calculating the CT numbers of the target object (P); and a feedback controller (7) for providing to the voltage source (8) a voltage control signal; wherein the energy spectrum measured by said kV meter is used to adjust the voltage control signal so as to maintain the voltage substantially constant at a reference level established during calibration. The detector system (3) includes an array of detectors (column 4; line 54 – column 5; line 58).

With respect to claim 18, Popescu discloses (Fig. 2) an apparatus for stabilizing CT number calculations by a system having an x-ray source (1) for generating x-rays (2) in response to a voltage provided by a voltage source (8), the apparatus comprising: a kV meter (9) for measuring a spectrum of x-rays (2) generated by the x-ray source (11) so that the voltage provided by the voltage source (8) can be adjusted to a reference level, and a feedback controller (7) for providing to the voltage source (8) a voltage control signal based on the measured x-ray spectrum so that the voltage can be adjusted in response to said control signal so as to maintain the voltage constant at the reference level, thereby substantially reducing, a variation in the calculated values of the CT numbers of a target object (P) (see abstract).

***Allowable Subject Matter***

5. Claims 13-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. With respect to claim 13-15 prior art fails to disclose or make obvious a CT system comprising a feedback controller for providing to the voltage source a voltage control signal; wherein the energy spectrum measured by a kV meter is used to adjust the voltage control signal so as to maintain the voltage substantially constant at a reference level established during calibration, and wherein the reference level is the voltage level at which calculation by the CT system of the CT number of a sample having a known CT number value yielding the correct known CT number value; wherein the kV meter includes a principal detector for detecting x-rays generated by the x-ray source so as to generate a first intensity magnitude, and an auxiliary detector for detecting x-rays generated by the x-ray source so as to generate a second intensity magnitude, the auxiliary detector including an absorber that preferentially absorbs x-ray photons having a relatively low energy; and wherein the voltage control signal is proportional to a known function of the first and second intensity magnitudes.

7. Claims 1-11, 17, 19 and 20 are allowed.

8. The following is an examiner's statement of reasons for allowance:  
Claims 1-10 are allowed because prior art fails to disclose or make obvious a method of stabilizing the calculation of CT numbers by a CT system comprising: adaptively regulating the voltage based on the energy spectrum measured from an X-ray source, so as to prevent any deviation in the voltage from a reference level and maintaining a voltage substantially constant at the reference level by repeating steps of measuring the energy spectrum of the X-rays generated by an X-ray source during subsequent CT number measurements by the CT system.

Claim 11 is allowed because prior art fails to disclose or make obvious a method of stabilizing the measurement of CT numbers by a CT system, the method comprising: generating and providing a voltage control signal to maintain a voltage substantially constant at a reference level, thereby substantially reducing in the CT system a variation in the calculated values of CT numbers; wherein the voltage control signal is proportional to a known function of a principal detector generated first and by an auxiliary detector including a relatively low energy absorber generated second intensity magnitudes.

Claim 17 are allowed because prior art fails to disclose or make obvious a CT system for performing stabilized CT number measurements, comprising: a feedback controller for providing to a voltage source a voltage control signal; wherein the voltage control signal is adjusted as a function of a ratio of a principal detector generated first and by an auxiliary detector including a relatively low energy absorber generated second intensity magnitudes to maintain said voltage substantially constant at a reference level established during calibration, thereby substantially reducing in the CT system a variation in the measured values of CT numbers;

Claims 19 and 20 are allowed because prior art fails to disclose or make obvious an apparatus for stabilizing CT number calculations in a CT system comprising: a feedback controller for providing to a voltage source a voltage control signal; wherein the voltage control signal is adaptively adjusted, based on a predetermined function of a principal detector generated first and by an auxiliary detector including a relatively low energy absorber generated second intensity magnitudes to maintain the voltage

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substantially constant at a reference level for which the calculation by the CT system of the CT number of a sample having a known CT number value yields the correct known CT number value.

### ***Conclusion***


9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Yokouchi et al. (US Patent 5,022,063) and Siedband (US Patent 4,361,900) disclose voltage regulated the X-ray sources power supplies.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Irakli Kiknadze whose telephone number is (703) 305-6464. The examiner can normally be reached on M-F(8:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Irakli Kiknadze  
May 29, 2003

  
SUPERVISOR  
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